

## GAS STORAGE FIELD REVIEW

Add solid samples to the internal corrosion part of the form. A completed **Standard Inspection Report** is to be submitted to the Director within 60 days from completion of the inspection. A **Post Inspection Memorandum (PIM)** is to be completed and submitted to the Director within 30 days from the completion of the inspection, or series of inspections, and is to be filed as part of the **Standard Inspection Report**.

Inspection Report		Post Inspection Memorandum	
Inspector/Submit Date: _____		Inspector/Submit Date: _____	
		Peer Review/Date: _____	
		Director Approval/Date: _____	
<b>POST INSPECTION MEMORANDUM (PIM)</b>			
Name of Operator:		OPID #:	
Name of Unit(s):		Unit #(s):	
Records Location:			
Unit Type & Commodity:			
Inspection Type:		Inspection Date(s):	
OPS Representative(s):		AFO Days:	

<b>Summary:</b>
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<b>Findings:</b>
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# GAS STORAGE FIELD REVIEW

<b>Name of Operator:</b>		
<b>OP ID No.</b> <sup>(1)</sup>		<b>Unit ID No.</b> <sup>(1)</sup>
<b>HQ Address:</b>	<b>System/Unit Name &amp; Address:</b> <sup>(1)</sup>	
<b>Co. Official:</b> <b>Phone No.:</b> <b>Fax No.:</b> <b>Emergency Phone No.:</b>	<b>Activity Record ID No.:</b> <b>Phone No.:</b> <b>Fax No.:</b> <b>Emergency Phone No.:</b>	
<b>Persons Interviewed</b>	<b>Title</b>	<b>Phone No.</b>
<b>OPS Representative(s)</b> <sup>(1)</sup>		<b>Inspection Date(s)</b> <sup>(1)</sup>
<b>Company System Maps</b> (Copies for Region Files):		

**Counties of Operation:** (list each field separately)

**Storage Field(s) Description:** (list each field separately)

**Inspection Summary:**

<b>The attached evaluation form should be used in conjunction with 49CFR Parts 191 and 192.</b>
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<sup>1</sup> Information not required if included on page 1.  
Form-12 Gas Storage Field Review (Rev. 03/17/05 through Amdts.192-98 and 192-94 2<sup>nd</sup> correction)

# GAS STORAGE FIELD REVIEW

PIPE TYPE						
	Bare steel	Coated steel	Ineffectively Coated	Pre70-ERW	Plastic	Other: must specify type
<b>Footage/Mileage</b>						

PIPE SPECIFICATIONS (2" AND LARGER)						
<b>Diameter(s)</b>						
<b>Pipe Grade(s)</b>						
<b>Wall Thickness(s)</b>						
<b>Footage/Mileage</b>						

WELL STIMULATION
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ACIDIZING	
Acidizing treatments used to stimulate the wells? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Type(s) of acids used in treating the wells:	
Type(s) of inhibitors used with the acid(s):	
Frequency of the treatments:	Volume of acid per treatment:
Well cleanup procedure following treatment:	
If treatment is flowed back into the well/injection line, criteria used to determine that the treatment will not cause internal corrosion or erosion of the pipe:	

FRACTURING	
Fracturing treatments used to stimulate the wells? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Type(s) of fracturing fluids used in treating the wells:	
Type(s) of inhibitors used with the fracturing fluid(s):	
Frequency of the treatments:	Amount of sand per treatment:
Well cleanup procedure following treatment:	
If treatment is flowed back into the well/injection line, criteria used to determine that the treatment will not cause internal corrosion or erosion of the pipe:	

# GAS STORAGE FIELD REVIEW

<b>GAS and LIQUID HANDLING FACILITIES</b>	
<b>GAS COMPRESSION</b>	
Location of compressors:	
Number, Size (HP), and Date of Installation of Units:	
<b>GAS DEHYDRATION</b>	
Location of dehydration units:	
Type(s) of dehydration process used:	
Number of dehydration units:	Dehydration capacity:
<b>GAS SWEETENING (Acid Gas Treating)</b>	
Location of sweetening units:	
Type(s) of sweetening process used:	
Number of sweetening units:	Sweetening capacity:
<b>GAS / LIQUID SEPARATION</b>	
<b>SCRUBBERS / SEPARATORS:</b>	
Location of scrubbers/separators:	
Type(s) of scrubbers/separators used:	
Number of scrubbers/separators:	Separation capacity:
<b>DRIPS:</b>	
Location of drips:	
Type(s) of drips used:	
Number of drips:	
Frequency of draining or blowing drips:	

# GAS STORAGE FIELD REVIEW

FIELD OPERATING PARAMETERS						
PRESSURES, RATES and TEMPERATURES						
	Pressure, psi		Flow Rate, MMcf/day		Temperature, °F	
	Injection	Withdrawal	Injection	Withdrawal	Injection	Withdrawal
Maximum						
Maximum						
Maximum Allowable Operating Pressure (Field):						
WATER, CO <sub>2</sub> , and O <sub>2</sub> CONTENT						
	Water, lbs./MMcf	CO <sub>2</sub> ,	H <sub>2</sub> S, ppm	O <sub>2</sub> , %		
Injection Cycle						
Withdrawal Cycle						

  

FIELD OPERATING AND MAINTENANCE HISTORY			
LEAKS			
Are leak surveys of the field being conducted? (49 CFR 192.706)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Have any leaks been found over the past 5 years?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Number of leaks:
Types of leaks that have occurred?			
Cause(s) of the leaks:			
Location(s) of the leaks:			
Has a trend analysis been performed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
If a trend analysis has been done, what do the results indicate?			
FAILURES			
Have any failures occurred over the past 5 years?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Number of failures:
Type(s) of failures that have occurred:			
Cause(s) of the failures:			
Location(s) of the failures:			
Has a trend analysis been performed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
If a trend analysis has been done, what do the results indicate?			
LINE REPLACEMENTS			
Have any lines been replaced over the past 5 years?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Number of replacements:
Type(s) of replacements:			
Location(s) of the replacements:			
Reason(s) for replacements:			
LINE REPAIRS			

## GAS STORAGE FIELD REVIEW

<b>FIELD OPERATING AND MAINTENANCE HISTORY</b>			
Have any lines been repaired over the past 5 years?		<input type="checkbox"/> Yes <input type="checkbox"/> No	Number of repairs:
Type(s) of repairs:			
Location(s) of the repairs:			
Reason(s) for the repairs:			
<b>VALVE REPLACEMENTS</b>			
Have any valves been replaced over the past 5 years?		<input type="checkbox"/> Yes <input type="checkbox"/> No	Number of replacements:
Type(s) of valve replacements:			
Location(s) of the replacements:			
Reason(s) for the replacements:			
<b>GAS and LIQUID HANDLING FACILITY UPSETS</b>			
	Gas Dehydration Units	Gas Sweetening Units	Separators
Number of upsets – past 3 years			
Cause(s) of the upsets:			
Has a trend analysis been performed?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
If a trend analysis has been done, what do the results indicate?			

<b>CORROSION CONTROL AND MONITORING</b>
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<b>EXTERNAL CORROSION</b>					
Are the field piping and related storage field facilities cathodically protected? (49 CFR 192 Subpart I)			<input type="checkbox"/> Yes		<input type="checkbox"/> No
Type(s) of cathodic protection used:		<input type="checkbox"/> Impressed Current		<input type="checkbox"/> Galvanic Anodes	<input type="checkbox"/> Combination
Criteria used to determine adequate cathodic protection:					
Does the field piping system contain any bare or ineffectively coated pipe?			<input type="checkbox"/> Yes		<input type="checkbox"/> No
Location(s) of the bare or ineffectively coated pipe:					
Amount of bare of ineffectively coated pipe:					
Are corrosion monitoring procedures established for the field piping and related storage field facilities?			<input type="checkbox"/> Yes		<input type="checkbox"/> No
<b>MONITORING</b>					
Pipe-to-soil readings	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Exposed pipe reports	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Close interval surveys	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Leak surveys	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Line current surveys	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Instrumented inspection surveys	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Remedial measures taken to mitigate corrosion:					

# GAS STORAGE FIELD REVIEW

INTERNAL CORROSION			
Are corrosion monitoring procedures established for the field piping and related storage field facilities?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>MONITORING</b>			
Corrosion coupons	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Pipe replacement reports surveys
Gas samples	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Leak surveys
Water samples	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Instrumental inspection surveys
Solids samples	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>CORROSION COUPONS</b>			
Frequency coupons are analyzed:			
Location(s) where coupons are installed:			
<b>GAS SAMPLES</b>			
Frequency of sampling:			
Location(s) where the samples taken:			
Are the gas samples analyzed for:		Amount of the following present in the gas:	
Carbon dioxide (CO <sub>2</sub> )	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Carbon dioxide (CO <sub>2</sub> ) _____
Hydrogen sulfide (H <sub>2</sub> S)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Hydrogen sulfide (H <sub>2</sub> S) _____
Oxygen (O <sub>2</sub> )	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Oxygen (O <sub>2</sub> ) _____
Water vapor	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Water vapor _____
What carbon dioxide (CO <sub>2</sub> ) partial pressure criteria are used to establish carbon dioxide (CO <sub>2</sub> ) corrosivity ranges?			
What is the carbon dioxide (CO <sub>2</sub> ) corrosivity ranges?			
What is the carbon dioxide (CO <sub>2</sub> ) partial pressure?			
<b>WATER/LIQUIDS SAMPLES</b>			
Frequency of sampling:			
Locations where the samples are taken:			
What constituents are the water samples analyzed for? ( <b>Refer to the Water Analysis Checklist</b> )			
Concentration of the following present in water:		Amount of the following gases dissolved in the water:	
Iron (Fe <sup>++</sup> )	_____	Carbon dioxide (CO <sub>2</sub> )	_____
Manganese (Mn <sup>++</sup> )	_____	Hydrogen sulfide (H <sub>2</sub> S)	_____
Chlorides (Cl <sup>-</sup> )	_____	Oxygen (O <sub>2</sub> )	_____
Sulfates (SO <sub>4</sub> <sup>=</sup> )	_____		
Is the pH of the water below 6.8? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Is hydrostatic test water sampled for the presence of bacteria? <input type="checkbox"/> Yes <input type="checkbox"/> No			

## GAS STORAGE FIELD REVIEW

INTERNAL CORROSION					
Are liquids tested for evidence of excessive glycol in the pipeline, which if deteriorated, could lower the pH? <input type="checkbox"/> Yes <input type="checkbox"/> No					
SOLIDS SAMPLES (collected at pig receivers)					
Frequency of sampling:					
Locations where the samples taken:					
Are solids observed and/or tested for the following components?					
Iron Oxide	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Scales	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Iron Sulfide	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Sand	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is the volume of solids increasing or decreasing between pig runs?					
Comments:					

INSTRUMENTED INSPECTION SURVEYS	
Frequency surveys are conducted:	
Lines that have been surveyed and when the survey was conducted:	

INHIBITOR PROGRAM	
Has a corrosion inhibitor program been established for the field piping and related storage field facilities? <input type="checkbox"/> Yes <input type="checkbox"/> No	
When did the program start?	
Type(s) of treatment method used: <input type="checkbox"/> Batch <input type="checkbox"/> Continuous	
Type(s) of inhibitors used:	
Are liquid samples periodically taken to test for residual corrosion inhibitor, to help determine effectiveness? <input type="checkbox"/> Yes <input type="checkbox"/> No	

MAINTENANCE PIGGING	
(See also solids and water sampling, inhibitor sections)	
Does operator have a maintenance pigging program designed to sweep the lines of sediments and/or scale? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Does operator adhere to the pigging program? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Comments:	



# GAS STORAGE FIELD REVIEW

<b>CONTROLLING GAS VELOCITY – INTERNAL CORROSION AND EROSION</b>		
Have target flow rates been determined for the field piping system?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are injection/withdrawal flow rates kept within the targeted flow rates, to minimize sediment and water build-up, and to manage erosion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
Has erosion been observed during replacement of components (lines, valves, fittings, etc.)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Locations where erosion has been found:		
Remedial measures taken to mitigate erosion:		

<b>ATMOSPHERIC CORROSION</b>		
Are corrosion monitoring procedures established for the field piping and related storage field facilities?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Location(s) where corrosion has been found:		
Remedial measures taken to mitigate corrosion:		

<b>SAFETY DEVICES and SYSTEMS</b>
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<b>SURFACE FACILITIES</b>		
Has a system safety analysis of the field piping and related storage facilities been performed:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Has a safety analysis function evaluation chart for the field piping and related storage field facilities been prepared?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
<b>PRESSURE SAFETY DEVICES:</b>		
<b>COMPRESSORS</b>		
Is each compressor, per 49 CFR 192.169, equipped with pressure safety devices for overpressure protection?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pressure protection provided by:	Location of pressure safety devices:	
Primary _____	Primary _____	
Secondary _____	Secondary _____	
<b>PRESSURE VESSELS</b>		
Is the working pressure of each pressure vessel (dehydrator, scrubber, etc.) greater than the MAOP?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is each pressure vessel equipped with pressure safety devices for overpressure protection?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Pressure protection provided by:	Location of pressure safety devices:	
Primary _____	Primary _____	
Secondary _____	Secondary _____	
<b>HEADERS, LATERALS and WELL LINES</b>		
Are the headers, laterals and well lines equipped with pressure safety devices for overpressure protection?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

## GAS STORAGE FIELD REVIEW

### SURFACE FACILITIES

<b>SURFACE FACILITIES</b>			
Pressure protection provided by:		Location of pressure safety devices:	
Primary _____		Primary _____	
Secondary _____		Secondary _____	
<b>GAS DETECTION SAFETY DEVICES:</b>			
Is each compressor, per 49 CFR 192.736, building equipped with gas detection safety devices?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are other buildings that contain gas handling equipment equipped with gas detection safety devices?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Type(s) of gas detection safety devices: <input type="checkbox"/> Combustible gas (L.E.L.)		<input type="checkbox"/> Hydrogen Sulfide (H <sub>2</sub> S)	<input type="checkbox"/> Other:
Type(s) of alarms used to notify personnel to the presence of gas:		<input type="checkbox"/> Visual	<input type="checkbox"/> Audible <input type="checkbox"/> Combination
<b>FIRE DETECTION SAFETY DEVICES:</b>			
Is each compressor building equipped with fire detection safety devices?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Are other buildings that contain gas handling equipment equipped with fire detection safety devices:		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Type(s) of fire detection safety devices:			
<input type="checkbox"/> Flame	<input type="checkbox"/> Heat	<input type="checkbox"/> Smoke	<input type="checkbox"/> Fusible Material
<input type="checkbox"/> Other:			
Type(s) of alarms used to notify personnel to the presence of fire:			
<input type="checkbox"/> Visual	<input type="checkbox"/> Audible	<input type="checkbox"/> Combination	
<b>EMERGENCY SHUTDOWN SYSTEM:</b>			
Is each compressor station, per 49 CFR 192.167, equipped with a remote controlled emergency shutdown system?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the gas detection system activate the compressor station emergency shutdown system?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
Does the fire detection system activate the compressor station emergency shutdown system?		<input type="checkbox"/> Yes	<input type="checkbox"/> No

### WELLS

<b>WELLS</b>		
Is each well equipped with a well storage safety valve?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
If not, are there plans to equip each well with a well storage safety valve?	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Reasons why wells should not be equipped with well storage safety valve(s)?		

## **GAS STORAGE FIELD REVIEW**

<b>ADDITIONAL COMMENTS</b>

## GAS STORAGE FIELD REVIEW

### WATER ANALYSIS CHECKLISTS

Constituent			Does Operator test for . . .			Operator's "threshold"	Constituent			Does Operator test for . . .			Operator's "threshold"
			Yes	No	Yes					No			
Sodium		Na <sup>+</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Chloride		Cl <sup>-</sup>	<input type="checkbox"/>		<input type="checkbox"/>	
Potassium		K <sup>+</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Sulfate		SO <sub>4</sub> <sup>=</sup>	<input type="checkbox"/>		<input type="checkbox"/>	
Calcium		Ca <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Carbonate		CO <sub>3</sub> <sup>=</sup>	<input type="checkbox"/>		<input type="checkbox"/>	
Magnesium		Mg <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Bicarbonate		HCO <sub>3</sub> <sup>-</sup>	<input type="checkbox"/>		<input type="checkbox"/>	
Iron		Fe <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Hydroxide		OH <sup>-</sup>	<input type="checkbox"/>		<input type="checkbox"/>	
Barium		Ba <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Dissolved Oxygen		O <sub>2</sub>	<input type="checkbox"/>		<input type="checkbox"/>	
Strontium		Sr <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Dissolved Carbon Dioxide		CO <sub>2</sub>	<input type="checkbox"/>		<input type="checkbox"/>	
Manganese		Mn <sup>++</sup>	<input type="checkbox"/>		<input type="checkbox"/>		Dissolved Hydrogen Sulfide		H <sub>2</sub> S	<input type="checkbox"/>		<input type="checkbox"/>	
			<input type="checkbox"/>		<input type="checkbox"/>					<input type="checkbox"/>		<input type="checkbox"/>	
			<input type="checkbox"/>		<input type="checkbox"/>					<input type="checkbox"/>		<input type="checkbox"/>	

Other	Does Operator test for . . .		Operator's "threshold"	Other	Does Operator test for . . .		Operator's "threshold"
	Yes	No			Yes	No	
Acidity	<input type="checkbox"/>	<input type="checkbox"/>		Alkalinity	<input type="checkbox"/>	<input type="checkbox"/>	
pH	<input type="checkbox"/>	<input type="checkbox"/>		Salinity	<input type="checkbox"/>	<input type="checkbox"/>	
Total Dissolved Solids (TDS)	<input type="checkbox"/>	<input type="checkbox"/>		Acid-producing Bacteria	<input type="checkbox"/>	<input type="checkbox"/>	
Sulfate-reducing Bacteria	<input type="checkbox"/>	<input type="checkbox"/>					

Excessive values of the above-listed constituents and properties, dependent upon operating conditions and other factors that may be unique to the storage field, could indicate a corrosive condition in the pipeline.

# GAS STORAGE FIELD REVIEW

Unless otherwise noted, all code references are to 49CFR Part 192. S – Satisfactory U – Unsatisfactory N/A – Not Applicable N/C – Not Checked  
If an item is marked U, N/A, or N/C, an explanation must be included in this report.

PIPELINE INSPECTION (Field)		S	U	N/A	N/C
.179	Valve Protection from Tampering or Damage				
.463	Cathodic Protection				
.465	Rectifiers				
.479	Pipeline Components Exposed to the Atmosphere				
.605	Knowledge of Operating Personnel				
.707	ROW Markers, Road and Railroad Crossings				
.719	Pre-pressure Tested Pipe ( <b>Markings and Inventory</b> )				
.739	Pressure Limiting and Regulating Devices ( <b>Mechanical</b> )				
.743	Pressure Limiting and Regulating Devices ( <b>Capacities</b> )				
.745	Valve Maintenance				
.751	Warning Signs				
.801 - .809	Operator qualification questions – See Attachment 2.				

**Comments:**

COMPRESSOR STATIONS INSPECTION (Field)		S	U	N/A	N/C
(Note: Facilities may be “Grandfathered”)					
.163 (c)	Main operating floor must have (at least) two (2) separate and unobstructed exits				
	Door latch must open from inside without a key				
	Doors must swing outward				
(d)	Each fence around a compressor station must have (at least) 2 gates or other facilities for emergency exit				
	Each gate located within 200 ft of any compressor plant building must open outward				
	When occupied, the door must be opened from the inside without a key				
(e)	Does the equipment and wiring within compressor stations conform to the <b>National Electric Code, ANSI/NFPA 70?</b>				
.165(a)	If applicable, are there liquid separator(s) on the intake to the compressors?				
.165(b)	Do the liquid separators have a manual means of removing liquids?				
	If slugs of liquid could be carried into the compressors, are there automatic dumps on the separators, Automatic compressor shutdown devices, or high liquid level alarms?				
.167(a)	ESD system must:				
	- Discharge blowdown gas to a safe location				
	- Block and blowdown the gas in the station				
	- Shut down gas compressing equipment, gas fires, electrical facilities in compressor building and near gas headers				
	- Maintain necessary electrical circuits for emergency lighting and circuits needed to protect equipment from damage				
	ESD system must be operable from at least two locations, each of which is:				
.167 (b)	- Outside the gas area of the station				
	- Not more than 500 feet from the limits of the station				
	- ESD switches near emergency exits?				
	For stations supplying gas directly to distribution systems, is the ESD system configured so that the LDC will not be shut down if the ESD is activated?				

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COMPRESSOR STATIONS INSPECTION (Field)		S	U	N/A	N/C
(Note: Facilities may be “Grandfathered”)					
.167(c)	Are ESDs on platforms designed to actuate automatically by...				
	- For unattended compressor stations, when:				
	▪ The gas pressure equals MAOP plus 15%?				
	▪ An uncontrolled fire occurs on the platform?				
	- For compressor station in a building, when				
	▪ An uncontrolled fire occurs in the building?				
	▪ Gas in air reaches 50% or more of LEL in a building with a source of ignition (facility conforming to <b>NEC Class 1, Group D</b> is not a source of ignition)?				
.171(a)	Does the compressor station have adequate fire protection facilities? If fire pumps are used, they must not be affected by the ESD system.				
(b)	Do the compressor station prime movers (other than electrical movers) have over-speed shutdown?				
(c)	Do the compressor units alarm or shutdown in the event of inadequate cooling or lubrication of the unit(s)?				
(d)	Are the gas compressor units equipped to automatically stop fuel flow and vent the engine if the engine is stopped for any reason?				
(e)	Are the mufflers equipped with vents to vent any trapped gas?				
.173	Is each compressor station building adequately ventilated?				
.457	Is all buried piping cathodically protected?				
.481	Atmospheric corrosion of aboveground facilities				
.603	Does the operator have procedures for the start-up and shut-down of the station and/or compressor units?				
	Are facility maps current/up-to-date?				
.615	Emergency Plan for the station on site?				
.619	Review pressure recording charts and/or SCADA				
.707	Markers				
.731	Overpressure protection – reliefs or shutdowns				
.735	Are combustible materials in quantities exceeding normal daily usage, stored a safe distance from the compressor building?				
	Are aboveground oil or gasoline storage tanks protected in accordance with <b>NEPA standard No. 30?</b>				
.736	Gas detection – location				

**Comments:**

REPORTING RECORDS		S	U	N/A	N/C
191.5	Telephonic reports to NRC (800-424-8802)				
191.15	Written incident reports; supplemental incident reports (DOT Form RSPA F 7100.2)				
191.17 (a)	Annual Report (DOT Form RSPA F 7100.2-1)				
191.23	Safety related condition reports				
192.727 (g)	Abandoned facilities offshore, onshore crossing commercially navigable waterways reports				

# GAS STORAGE FIELD REVIEW

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CONSTRUCTION RECORDS		S	U	N/A	N/C
.225	Test Results to Qualify Welding Procedures				
.227	Welder Qualification				
.241 (a)	Visual Weld Inspector Training/Experience				
.243 (b)(2)	Nondestructive Technician Qualification				
(c)	NDT procedures				
(f)	Total Number of Girth Welds				
(f)	Number of Welds Inspected by NDT				
(f)	Number of Welds Rejected				
(f)	Disposition of each Weld Rejected				
.303	Construction Specifications				
.325	Underground Clearance				
.327	Amount, Location, Cover of each Size of Pipe Installed				
.455	Cathodic Protection				

OPERATIONS and MAINTENANCE RECORDS			S	U	N/A	N/C												
.603(b)	.605(a)	Procedural Manual Review – Operations and Maintenance ( <b>1 per yr/15 months</b> )																
.603(b)	.605(c)	Abnormal Operations																
.603(b)	.605(b)(3)	Availability of construction records, maps, operating history to operating personnel																
.603(b)	.605(b)(8)	Periodic review of personnel work – effectiveness of normal O&M procedures																
.603(b)	.605(c)(4)	Periodic review of personnel work – effectiveness of abnormal operation procedures																
.709	.614	Damage Prevention ( <b>Miscellaneous</b> )																
.709	.609	Class Location Study ( <b>If Applicable</b> )																
.603(b)	.615(b)(1)	Location Specific Emergency Plan																
.603(b)	.615(b)(2)	Emergency Procedure training, verify effectiveness of training																
.603(b)	.615(b)(3)	Employee Emergency activity review, determine if procedures were followed.																
.603(b)	.615(c)	Liaison Program with Public Officials																
.603(b)	.616	Public Education																
.517		Pressure Testing																
.709	.619	Maximum Allowable Operating Pressure ( <b>MAOP</b> )																
.709	.625	Odorization of Gas																
.709	.705	Patrolling ( <b>Refer to Table Below</b> )																
<table><tr><td><b>Class Location</b></td><td><b>At Highway and Railroad Crossings</b></td><td><b>At All Other Places</b></td></tr><tr><td><b>1 and 2</b></td><td><b>2/yr (7½ months)</b></td><td><b>1/yr (15 months)</b></td></tr><tr><td><b>3</b></td><td><b>4/yr (4½ months)</b></td><td><b>2/yr (7½ months)</b></td></tr><tr><td><b>4</b></td><td><b>4/yr (4½ months)</b></td><td><b>4/yr (4½ months)</b></td></tr></table>							<b>Class Location</b>	<b>At Highway and Railroad Crossings</b>	<b>At All Other Places</b>	<b>1 and 2</b>	<b>2/yr (7½ months)</b>	<b>1/yr (15 months)</b>	<b>3</b>	<b>4/yr (4½ months)</b>	<b>2/yr (7½ months)</b>	<b>4</b>	<b>4/yr (4½ months)</b>	<b>4/yr (4½ months)</b>
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.709	.706	Leak Surveys ( <b>Refer to Table Below</b> )																
<table><tr><td><b>Class Location</b></td><td><b>Required</b></td><td><b>Not Exceed</b></td></tr><tr><td><b>1 and 2</b></td><td><b>1/yr</b></td><td><b>15 months</b></td></tr><tr><td><b>3</b></td><td><b>2/yr</b></td><td><b>7½ months</b></td></tr><tr><td><b>4</b></td><td><b>4/yr</b></td><td><b>4½ months</b></td></tr></table>							<b>Class Location</b>	<b>Required</b>	<b>Not Exceed</b>	<b>1 and 2</b>	<b>1/yr</b>	<b>15 months</b>	<b>3</b>	<b>2/yr</b>	<b>7½ months</b>	<b>4</b>	<b>4/yr</b>	<b>4½ months</b>
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.603b/.727g	.727	Abandoned Pipelines; Underwater Facility Reports																

# GAS STORAGE FIELD REVIEW

Unless otherwise noted, all code references are to 49CFR Part 192. S – Satisfactory U – Unsatisfactory N/A – Not Applicable N/C – Not Checked  
If an item is marked U, N/A, or N/C, an explanation must be included in this report.

OPERATIONS and MAINTENANCE RECORDS			S	U	N/A	N/C
.709	.731(a)	Compressor Station Relief Devices (1 per yr/15 months)				
.709	.731(c)	Compressor Station Emergency Shutdown (1 per yr/15 months)				
.709	.736(c)	Compressor Stations – Detection and Alarms (Performance Test)				
.709	.739	Pressure Limiting and Regulating Stations (1 per yr/15 months)				
.709	.743	Pressure Limiting and Regulator Stations – Capacity (1 per yr/15 months)				
.709	.745	Valve Maintenance (1 per yr/15 months)				
.709	.749	Vault Maintenance (≥200 cubic feet)(1 per yr/15 months)				
.603(b)	.751	Prevention of Accidental Ignition (hot work permits)				
.603(b)	.225(b)	Welding – Procedure				
.603(b)	.227/.229	Welding – Welder Qualification				
.603(b)	.243(b)(2)	NDT – NDT Personnel Qualification				
.709	.243(f)	NDT Records (Pipeline Life)				
.709		Repair: pipe (Pipeline Life); Other than pipe (5 years)				

Comments:

CORROSION CONTROL RECORDS			S	U	N/A	N/C
.491	.491(a)	Maps or Records				
.491	.459	Examination of Buried Pipe when Exposed				
.491	.465(a)	Annual Pipe-to-soil Monitoring (1 per yr/15 months)				
.491	.465(b)	Rectifier Monitoring (6 per yr/2½ months)				
.491	.465(c)	Interference Bond Monitoring – Critical (6 per yr/2½ months)				
.491	.465(c)	Interference Bond Monitoring – Non-critical (1 per yr/15 months)				
.491	.465(d)	Prompt Remedial Actions				
.491	.465(e)	Unprotected Pipeline Surveys, CP active corrosion areas (1 per 3 cal yr/39 months)				
.491	.467	Electrical Isolation (Including Casings)				
.491	.469	Test Stations – Sufficient Number				
.491	.471	Test Lead Maintenance				
.491	.473	Interference Currents				
.491	.475(a)	Internal Corrosion; Corrosive Gas Investigation				
.491	.475(b)	Internal Corrosion; Internal Surface Inspection; Pipe Replacement				
.491	.477	Internal Corrosion Control Coupon Monitoring (2 per yr/7½ months)				
.491	.481	Atmospheric Corrosion Control Monitoring (1 per 3 cal yr/39 months onshore; 1 per yr/15 months offshore)				
.491	.483/.485	Remedial: Replaced or Repaired Pipe; coated and protected; corrosion evaluation and actions				

Comments:



# Attachment 1

## Internal Corrosion Worksheet – Natural Gas Pipelines

If an item is found to be unsatisfactory, an explanation must be included in this report.

**NOTE: Refer to OPS Enforcement Manual, Code Compliance Guidelines PART 192, SUBPART I: CORROSION CONTROL for Internal Corrosion**

1. Are internal corrosion control procedures established? Y \_\_\_\_ N \_\_\_\_
2. Is gas quality analysis done on a periodic basis for O<sub>2</sub>, H<sub>2</sub>O, H<sub>2</sub>S, and CO<sub>2</sub>? Y \_\_\_\_ N \_\_\_\_
3. Does operator inject corrosion inhibitor to mitigate internal corrosion? Y \_\_\_\_ N \_\_\_\_
4. Each coupon utilized or other means of monitoring internal corrosion must be checked two times each calendar year, but with interval not exceeding 7½ months. Y \_\_\_\_ N \_\_\_\_
5. Does operator control internal corrosion effects caused by water by dehydration and water-soluble inhibitors? Y \_\_\_\_ N \_\_\_\_
6. Does the operator pig their pipelines to remove any water or sludge buildups (sample analysis should be performed)? Y \_\_\_\_ N \_\_\_\_
7. Whenever pipe is removed (including coupons removed during hot taps), is it examined for evidence of internal corrosion? Y \_\_\_\_ N \_\_\_\_
8. Does the operator track internal corrosion and take corrective action to prevent recurrence? Y \_\_\_\_ N \_\_\_\_
9. Which method does the operator utilize to determine the effectiveness of its corrosion inhibition program?  
\_\_\_\_ Gas and Fluid Analysis  
\_\_\_\_ Rates of pipeline corrosion as determined by coupons  
\_\_\_\_ Solids removed from the system  
\_\_\_\_ Analysis of inhibitor samples from the pipeline  
\_\_\_\_ Magnetic and electronic device (pigs)  
\_\_\_\_ Other
10. Is the inhibitor compatible with the product being transported? Y \_\_\_\_ N \_\_\_\_ N/A \_\_\_\_
11. Is gas containing more than 0.25 grain of H<sub>2</sub>S per 100 standard cubic feet being stored in pipe-type or bottle-type holders?  
Y \_\_\_\_ N \_\_\_\_ N/A \_\_\_\_
12. Does the operator analyze water samples relating to corrosion activity at drips downstream of compressor stations, dehydration, and/or gas processing plants? Y \_\_\_\_ N \_\_\_\_ N/A \_\_\_\_
13. Has the operator identified low points throughout their system where fluids are likely to accumulate and does the operator identify how to remove the fluids from the lines? Y \_\_\_\_ N \_\_\_\_  
  
Does the operator specify the frequency in how often the fluids are removed? Y \_\_\_\_ N \_\_\_\_
14. Does the operator address fluid accumulation in unpig-able lines (i.e., fluid samples, coupons, etc.)? Y \_\_\_\_ N \_\_\_\_ N/A \_\_\_\_

**Comments:**

## Attachment 2

### Operator Qualification Worksheet

For any item below checked N, an explanation must be included in this report.

The following questions are to be used by the inspector to provide information in determining a need for a more intensive OQ field inspection.

1. Do the supervisors know what actions to take, as required by the operator's OQ program, when an individual's performance of a covered task may have contributed to an incident? Y \_\_\_\_\_ N \_\_\_\_\_
2. Do the supervisors know what actions to take, as required by the operator's OQ program, when an individual is identified who may no longer be qualified to perform a covered task? Y \_\_\_\_\_ N \_\_\_\_\_
3. Do the individuals performing covered tasks know how to recognize and react to abnormal operating conditions (AOCs) that may be encountered while performing tasks? Y \_\_\_\_\_ N \_\_\_\_\_
4. Are the employee and/or contractor individuals observed performing covered tasks qualified per OQ program requirements? (Documentation may be a hardcopies or database records available at the job site or local office.) Y \_\_\_\_\_ N \_\_\_\_\_
5. Are the individuals who are observed performing covered tasks adhering to operator's procedures? Y \_\_\_\_\_ N \_\_\_\_\_

**Comments:**